

1           WHAT IS CLAIMED:

2           1.       A method for making a multi-pass heat exchanger core comprising

3       the steps of:

4                  providing at least one coolant plenum for containing flowing  
5       coolant;

6                  installing adjacent to the at least one coolant plenum at least one  
7       first-pass plenum for containing a flowing heated fluid and defining a first area-in-  
8       flow of the heated fluid; and

9                  disposing adjacent to the at least one coolant plenum at least one  
10      subsequent-pass plenum for containing the heated fluid and defining a second  
11      area-in-flow of the heated fluid; and

12                 arranging the plenums so that the contained heated fluid flows past  
13      a coolant plenum at least twice;

14                 wherein the step of defining a first area-in-flow comprises defining a first area-in-  
15      flow which substantially exceeds the second area-in-flow.

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17           2.       The method of claim 1 wherein:

18                  the step of providing at least one coolant plenum comprises  
19       providing a plurality of coolant plenums;

20                  the step of installing at least one first-pass plenum comprises  
21       installing a plurality of first-pass plenums;

22                  the step of disposing at least one subsequent-pass plenum comprises  
23       disposing a plurality of subsequent-pass plenums; and

24                 further comprising the step of arranging the first-pass plenums and the  
25       subsequent-pass plenums in an alternating manner between cooling plenums,  
26       every second plenum being a cooling plenum.

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28           3.       The method of claim 1 further comprising the steps of:

1                   defining a first plurality of exhaust passages in each of the first-pass  
2       plenums to direct exhaust gases though the first-pass plenums; and  
3                   defining a second plurality of exhaust passages in each of the  
4       subsequent-pass plenums to direct exhaust gases though the subsequent-pass  
5       plenums;  
6       wherein the exhaust passages in each first-pass plenum substantially exceed in  
7       number the exhaust passages in each subsequent-pass plenum.  
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9                  4.       A method for making a multi-pass exhaust gas recirculation cooler  
10      comprising the steps of:

11                 providing a plurality of coolant plenums for containing flowing  
12      coolant;  
13                 disposing adjacent to at least one of the coolant plenums a plurality  
14      of first-pass plenums for containing hot exhaust gases;  
15                 disposing adjacent to at least one of the coolant plenums a plurality  
16      of subsequent-pass plenums for containing the hot exhaust gases;  
17                 defining a plurality of exhaust passages in each of the first-pass  
18      plenums; and  
19                 defining a plurality of exhaust gas passages in each the subsequent-  
20      pass plenums, wherein the exhaust gas passages have substantially equal radial  
21      cross sectional areas, and the total number of exhaust passages in the plurality of  
22      first-pass plenums substantially exceeds the total number of exhaust passages in  
23      the plurality of subsequent-pass plenums.

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25                 5.       The method of claim 4 comprising the further steps of:  
26                 disposing all the plenums substantially parallel; and  
27                 separating the first-pass plenums from the subsequent-pass plenums  
28      with at least one elongate divider substantially perpendicular to the plenums.  
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- 1           6.     The method of claim 4 comprising the further steps of:
- 2                 disposing all the plenums substantially parallel; and
- 3                 separating the first-pass plenums from the subsequent-pass plenums
- 4                 with at least one elongated divider parallel to the plenums.
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